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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/560,861	03/07/2006	Richard O'Dell	09931-00048-US	2089

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EXAMINER	
LISTVOYB, GREGORY	

ART UNIT	PAPER NUMBER
1796	

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01/02/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/560,861	O'DELL ET AL.	
	Examiner	Art Unit	
	Gregory Listvoyb	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 December 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) *4 and 15-24* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 5-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/15/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-14, drawn to conjugated polymer or oligomer (Ir), monomer and method of making classified in class 528, subclass 394.

II. Claims 15-19, drawn to process of making conjugated polymer or oligomer (I and Ip), classified in class 528, subclass varies.

III. Claims 20-24, drawn to process of using conjugated polymer or oligomer (I and Ip), classified in class 528, subclass 394.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and III are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make another and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case a conjugated polymer

can be used as a protective coatings for electronic device (see US 577070, Column 6, line 15), which is an optical device.

Inventions I and III are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different designs, modes of operation, and effects (MPEP § 802.01 and § 806.06). In the instant case, the different inventions of polymer Ir and I and Ip represent materially different products, which have different patentable distinct structures.

Inventions II and III are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different designs, modes of operation, and effects (MPEP § 802.01 and § 806.06). In the instant case, the inventions above relate to monomers and polymers having patentable distinct structures.

Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions require a different field of search (see MPEP § 808.02), restriction for examination purposes as indicated is proper.

This application contains claims directed to the following patentably distinct species: R1, R2, R3 and R4 are optionally substituted phenyl or optionally substituted C1-20 alkyl. The species are independent or distinct

because aryl and alkyl substitutions lead to a polymer having patentably distinct structures with different fundamental properties (Tg, mechanical properties, thermo-stability, light emitting capabilities).

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. R1, R2, R3 and R4 equal to C8H17 alkyl group is elected by the Applicant

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

During a telephone conversation with Ashley Pezzner on 12/12/07 a provisional election was made with traverse to prosecute the invention of Wallace et al, claims 1-14. Affirmation of this election must be made by applicant in

replying to this Office action. Claims 15-24 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 103

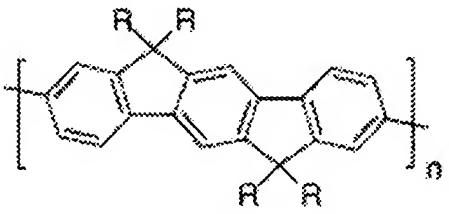
The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1- 3, 5, 8-12 rejected under 35 U.S.C. 103(a) as being unpatentable over Setayesh et al (Bridging the Gap between Polyfluorene and Ladder-Poly-*p*-phenylene:Synthesis and Characterization of Poly-2,8-indenofluorene, Macromolecules, 2000, *33,* 2016-2020), herein Setayesh in combination with Reisch (Dissertation, Oligo- und Poly(indenofluorene)..., Mainz, 2000, pp. 27 and 115) and evidences by Kim (Assemblies of conjugated polymers. Intermolecular

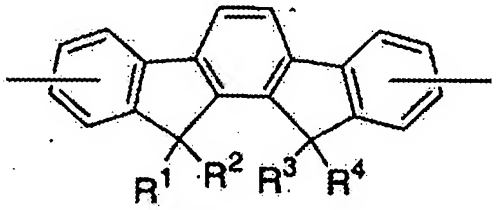
and intramolecular effects on the photophysical properties of conjugated polymers, Pure Appl. Chem., Vol. 74, No. 11, pp. 2031–2044, 2002) herein Kim.

Setayesh discloses a Poly-2,8-indenofluorene of the following structure (8a) (see page 2017):



8 a: R = octyl
b: R = ethylhexyl

which is trans isomer compare to cis polyindenofluorene, claimed in Claim 1:



(Ir)

Both Setayesh and the applicant use their polymers in light emitting devices.
In reference to Claims 9-12, Setayesh discloses a method of synthesis, identical to one of the Application examined (see reaction Scheme 2).

It is noted that the Applicant directly compares sic and trans structures in the Specification (see Table 1). The data from Table 1 reveal that there is no direct evidence that trans structures (Examples 6-9) have inferior performance compare to cis- structure (Example 5) in the following: CIEx (all the data are

comparable), CIEy (Polymer 5 comparable with Polymer 7), Half life (trans Polymer 6 is better than Polymer 5), Color shift, Delta V and Burning (random data, not dependent on cis and trans isomers).

The starting monomer for polyindenofluorene is trans-indenofluorene (see Scheme 2), analogous to one claimed in Claims 8-10. However, cis-indenofluorene, used in the Application is also known in the art.

Reisch uses cis- indenofluorene for preparing family of polymers for light emitting devices (see page 27 and 115).

Kim evidences that introducing of cis linkages in conjugated polymers used in light emitting devices leads to high emission yield (see page 2040).

Therefore, it would have been obvious to a person of ordinary skills in the art to use Reisch's cis- indenofluorene monomer as a starting material in Setayesh's synthesis in order to achieve high emission yield.

Claims 6-7 and 13-14 rejected under 35 U.S.C. 103(a) as being unpatentable over Setayesh in combination with Reisch and Inbasekaran (US 5777070) and evidences by Kim.

Setayesh discloses a Poly-2,8-indenofluorenes for light emitting diodes (see discussion above) based on trans poly indenofluorenes.

Reisch teaches cis- indenofluorenes monomers used as a starting material for light emitting diodes.

Both Setayesh and Reisch fail to disclose a second repeat unit in their polymers.

Inbasekaran teaches a conjugated polymer for light emitting diodes (see Column 8, line 20) having conjugated 9, 9 di-n-octylfluorene and naphthalene units in its structure (see Example 3).

Inbasekaran teaches Halogen and Boron-based leaving groups (see Column 3, line 5 an Example 3) used together and Palladium catalyst used with a base (see Column 4, line 30 and Example 3). Note that Inbasekaran uses his polymerization system to produce copolymers. Setayesh, Inbasekaran and Application methods are obvious variants of classical Yamamoto's synthesis (admitted prior art, see Spec page 6).

As evidences by Kim, strong intermolecular interferences deteriorate emission properties of conjugated polymers (see page 2040). Introducing of bulky Naphthalene group decreases the above interaction, since it disturbing chain packing.

Therefore, it would have been obvious to a person of ordinary skills in the art to introduce bulky Naphthalene group to modified Setayesh's polymer in order to enhance emission properties of conjugated polymer.

Claim 4 drawn to non-elected invention, since it contains non-elected species.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory Listvoyb whose telephone number is (571) 272-6105. The examiner can normally be reached on 10am-7pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Gregory Listvoyb
Examiner
Art Unit 1796

GL
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RABON SERGENT
PRIMARY EXAMINER